

AMENDMENTS TO THE CLAIMS:

1. (Currently Amended) A method for controlling and monitoring ~~the~~ production of a thermoplastic extrusion ~~profiles~~ profile, particularly in an in-line production process with a print step, ~~characterized by the following features~~ comprising:

(a) ~~The use of an optical neuro-fuzzy structured computer/design image data bank (12) for a visual representation of a thermoplastic extrusion profile design/pattern, wherein~~

(b) ~~the client transmits~~

transmitting in electronic form a model for a pattern/design image of an extrusion profile to be produced ~~in electronic form, meaning via the Internet, e-mail, or a client-specific network (13a-e) and using a TIFF and/or JPEG file and/or a different data format,~~ to the an optical neuro-fuzzy structured computer/design image data bank (12); ~~and wherein the~~

storing the image models ~~are stored~~ electronically and optically in the optical neuro-fuzzy structured computer/design image data bank (12) ~~and are linked~~

linking the image model to

(c) ~~an order for producing a design and/or pattern image of a thermoplastic extrusion profile; and~~

(d) electronically determining in the optical neuro-fuzzy structured computer/design image data bank (12), ~~the production product~~ parameters for ~~the~~ basic materials supplied by ~~the~~ a material supply facility (1), ~~the~~ extrusion parameters, including the cooling parameters for ~~the~~ an extrusion device with a cooling section (2), ~~the~~ pretreatment parameters for ~~the~~ a material pretreatment device (3, 3a-e), ~~the~~ optical design and pattern

image data and ~~the~~ printing parameters for the a printing device (4), ~~using a parameter~~
indicating whether to use the a serial background printing technique (4a) and/or ~~the a~~
piezo printing technique (4b), ~~the~~ coating parameters for the coating device (5), the
optical inspection parameters for ~~the an~~ optical inspection device (6), and ~~the~~ assembly
and packaging parameters for ~~the an~~ assembly and packaging device (7) ~~are electronically~~
~~and optically determined;~~

(e) selecting a serial background printing technique (4a) and/or a piezo printing
technique (4b) ~~is then selected~~ for the printing device (4) with the aid of the printing and
image/design parameters stored in the optical neuro-fuzzy structured computer/design
image data bank (12);₁ and

(f) ~~the client is sent~~sending an electronic confirmation ~~via the Internet, e-mail or a~~
~~client-specific network (13a-e)~~ from the optical neuro-fuzzy structured computer/design
image data bank (12) of the product and design parameters for producing a thermoplastic
extrusion profile.

2. (Currently Amended) The method according to claim 1, ~~characterized in that the optical and~~
~~electronic data for the design parameters, the method parameters, and the product parameters~~
further comprising:

~~are transmitted~~ transmitting at least said parameters from the~~via~~ optical neuro-fuzzy structured
computer/design image data bank (12) to an electronic network (10) and/or a cabled and/or radio-
controlled Ethernet (10a).

3. (Currently Amended) The method according to claim 2, ~~characterized in that~~ wherein the electronic network (10) is an electronic intelligent neuronal network (10b).

4. (Currently Amended) The method according to claim 2, ~~characterized in that~~ further comprising: connecting an intelligent neuronal network (10b) connects at least two additional in-line production lines (11) for producing thermoplastic extrusion profiles with an intelligent neuronal network; and ~~wherein an electronic production planning system (9) determines~~ determining the degree of utilization of the individual in-line production lines with an electronic production planning system (11).

5. (Currently Amended) The method according to claim 1, ~~characterized in that~~ further comprising: transmitting from the optical neuro-fuzzy structured computer/design image data bank (12) electronically ~~transmits~~ to a central control station (8) the product parameters for the basic materials, the extrusion ~~method~~ parameters, ~~[[-]]~~ including the extrusion cooling parameters, ~~[[-]]~~ the pretreatment parameters, the optical design and pattern image data and the printing parameters for the serial background printing and/or piezo printing techniques (4a,b), the coating parameters, the optical inspection parameters, ~~as well as~~ and the assembly and packaging parameters.

6. (Currently Amended) The method according to claim 5, ~~characterized in that~~ further comprising: using the optical and electronic neuro-fuzzy structured computer/design image data transmitted by the data bank (12) to the central control station (8) ~~on the whole are used to~~

control, regulate and monitor the production of at least one in-line production line (41) with the associated devices (4-7) and using the following production steps:

- (a) providing the basic material and material mixture;
- (b) ~~extrusion~~ extruding with subsequent cooling;
- (c) ~~material pretreatment~~ pretreating material for the printing operation;
- (d) printing by means of a serial background printing technique (4a) and/or a piezo printing technique (4b);
- (e) coating
- (f) ~~optically inspection of~~ inspecting the extrusion profile; and
- (g) ~~client[[-]]specific assembly~~ assembling and packaging according to pre-determined instructions.

7. (Currently Amended) The method according to claim 6, ~~characterized in that~~ further comprising: displaying the electronic and optical neuro fuzzy structured computer/design image data from the data bank (12) are used to display for the operating personnel in the central control station (8) the production control parameters and the production regulation parameters of the production devices (4-7) by means of a graphic user interface using the electronic and optical neuro fuzzy structured computer/design image data from the data bank(8a).

8. (Currently Amended) The method according to claim 6, ~~characterized in that~~ wherein the step of providing the basic material and material mixture further comprises: electronically transmitting from the central control station (8) via a network ~~electronically transmits~~ a request

for the basic material and/or basic material mixtures, ~~e.g. polyethylene, polypropylene, acryl butadiene styrene, polyvinylchloride etc or mixture combinations~~, to a material supply facility with a distribution system; (1) and ~~supplies~~ supplying these materials to the extrusion device (2) for the extrusion process.

9. (Currently Amended) The method according to claim 6, ~~characterized in that~~ wherein extruding with subsequent cooling further comprises: controlling and regulating with the central control station (8) ~~controls and regulates~~ the extrusion process in the extrusion device (2), such that the thermoplastic extrusion profiles are extruded according to ~~client received~~ client received specifications and corresponding to the product parameters and the extrusion parameters stored in the optical neuro-fuzzy structured computer/design image data bank (12).

10. (Currently Amended) The method according to claim 6, ~~characterized in that~~ wherein the step of extruding with subsequent cooling further comprises: following the extrusion, controlling and regulating with[[,]] the central control station (8) ~~controls and regulates the~~ a temperature for the cooling process of the extruded thermoplastic profile following the extrusion.

11. (Currently Amended) The method according to claim 6, ~~characterized in that~~ wherein the step of pretreating material for the printing operation further comprises: controlling and regulating with the central control station (8) ~~controls and regulates~~ the material pretreatment process in a material pretreatment device (3) by means of the pretreatment and process parameters.

12. (Currently Amended) The method according to claim 11, ~~characterized in that~~ wherein the material pretreatment device (3) comprises a flame-treatment device (3a) and a at least one of a physical and/or a chemical etching device (3b).

13. (Currently Amended) The method according to claim 12, ~~characterized in that~~ further comprising: the physical and/or chemical etching device (3b) realizes realizing a selective and/or reactive ion etching process and/or electro-chemical etching process on the thermoplastic extrusion profile with the physical and/or chemical etching device.

14. (Currently Amended) The method according to claim 12, ~~characterized in that~~ further comprising: controlling and regulating with the neuro-fuzzy structured computer/design image data bank (12) ~~controls and regulates~~ the pretreatment parameters and the method parameters for the etching device (3b), ~~as well as~~ and the etching process on a thermoplastic extrusion profile in the layer thickness range of 0.5 to 300µm, ~~preferably in the layer thickness range of 2 to 200µm~~, adapted to the material properties of the thermoplastic extrusion profile.

15. (Currently Amended) The method according to claim 6 ~~13~~, ~~characterized in that~~ further comprising: depositing following the etching process a bonding agent layer is ~~deposited~~ inside a coating device (3e) of the material pretreatment device (3), which deposit is controlled and regulated by the central control station, following the etching process (8).

16. (Currently Amended) The method according to claim 6, ~~characterized in that~~ further

comprising: controlling and regulating the central control station (8) controls and regulates the printing step for the thermoplastic extrusion profiles in a printing device (4); with the central control station using the neuro-fuzzy structured design/pattern image data and the associated printing parameters from data bank (12).

17. (Currently Amended) The method according to claim 16, ~~characterized in that~~ wherein the printing device (4) uses ~~makes use of~~ a background printing technique (4a) and/or a piezo printing technique (4b).

18. (Currently Amended) The method according to claim 16, ~~characterized in that~~ further comprising: storing the a multi-colored design/pattern image data and the printing parameters for the printing operation ~~are stored~~ in the central control station (8) in the form of neuro-fuzzy structured design/pattern printing image categories and print-control parameter categories ~~to permit a faster actuation of the printing device (4) which uses the serial background printing technique (4a) and/or the piezo printing technique (4b).~~

19. (Currently Amended) The method according to claim 16, ~~characterized in that~~ further comprising: controlling and regulating the central control station (8) controls and regulates the parallel background printing (4a) and/or piezo-printing techniques (4b) in a the printing device with the central control station (4) by means of the optical neuro-fuzzy structured design/pattern image data and the associated printing parameters, stored in the form of print image categories.

20. (Currently Amended) The method according to claim 6, ~~characterized in that~~ further comprising: controlling and regulating the central control station (8) controls and regulates a the coating device (5) with the central control station with the aid of the optical neuro-fuzzy structured coating parameters.

21. (Currently Amended) The method according to claim 20, ~~characterized in that~~ further comprising: depositing the coating device (5) deposits an abrasion-resistant layer, in particular a coat of lacquer, onto the thermoplastic extrusion profile with the coating device.

22. (Currently Amended) The method ~~device~~ according to claim 6, ~~characterized in that~~ further comprising:

recording an optical inspection device (6), comprising an image recording camera and an evaluation unit (14), records the a thermoplastic extrusion profile with the optical inspection device comprising an image-recording camera and an evaluation unit; and

transmits transmitting the optical and electronic pixel image data (15) to an optical neuro-fuzzy structured computer-aided inspection data bank (16) via radio or electronic network.

23. (Currently Amended) The method ~~device~~ according to claim 22, ~~characterized in that~~ further comprising: creating an electronic and optical image comparison (image mapping) is made between the pixel image data (15) in the optical neuro-fuzzy structured computer-aided inspection data bank (16) and the stored optical neuro-fuzzy structured computer design/design image data (12) for detecting production-related deviations and defects in at least one of the

printing, applied by the printing device (4; 4a-b), and/or in the coating deposited by the coating device (5).

24. (Currently Amended) The method ~~device~~ according to claim 22 23, ~~characterized in that~~ further comprising: transmitting the detected, production-related deviations and defects are ~~transmitted~~ via the radio or electronic network in the form of optical and electronic data from the optical neuro-fuzzy structured computer-aided inspection data bank (16) to the central control station; (8)

categorizing where they are categorized the detected, production-related deviations and defects by means of neuro-fuzzy technology with the central control station; and

~~stored~~ storing the detected, production-related deviations and defects as electronically and optically detected defect image data in the form of defect image categories.

25. (Currently Amended) The method according to claim 6 24, ~~characterized in that~~ further comprising: processing the stored neuro-fuzzy categorized defect image data/categories are ~~processed data-technologically~~ in the central control station; (8) and

controlling and regulating that the central control station (8) controls and regulates the correction of these production-related defects, occurring in the printing device (4) ~~that uses the background printing technique (4a) and/or the piezo printing technique (4b), with the central control station~~ by means of the electronic network (8b).

26. (Currently Amended) The method according to claim 6 23 ~~characterized in that~~ further

comprising: transmitting the central control station (8) transmits the defect data for the printing and/or coating operation via the electronic network (8b) to the assembly and packaging device from the central control station; (7) and

removing with that the assembly and packaging device (7) ~~removes~~ the defective thermoplastic extrusion profiles.

27. (Currently Amended) The method according to claim 6 26, ~~characterized in that~~ further comprising: assembling and packing the thermoplastic extrusion profiles produced without defects ~~are assembled and packaged~~ according to ~~client~~ received specifications and based on the assembly/packaging parameters stored in the optical neuro-fuzzy structured computer/design image data bank (12).

28. (Currently Amended) The method according to claim 1, ~~characterized in that the client is~~ further comprising: notified notifying via a network connection (13-a-e) a recipient of the delivery time for the finished thermoplastic extrusion profiles.

29. (New) The method according to claim 14, wherein the layer thickness range is in the range of 2 to 200µm.

30. (New) The method according to claim 21 wherein the abrasion-resistant layer comprises a coat of lacquer.